Frankly Speaking

In Appreciation

THE WHITE HOUSE
WASHINGTON

June 7, 1945

Dear Colonel Johnson:

The transportation facilities of the nation are now called upon for the most gigantic task in all the history of transportation. The American armies must be moved from the victorious battlefields of Europe to meet and wipe out the tyranny of the East. In order to do this job most of our soldiers will be transported the full length of the American continent.

It required every transportation ingenuity to assemble our armies in Europe over a period of four years. This time the job is to be done in ten months. The contemplation of this task would overtax our faith if we had not found during the course of this war that the impossible has become our daily job.

I am asking you to extend my congratulations to all of our transportation agencies—and their millions of workers—on the results they have accomplished. At the same time express my confidence in them for the greater effort that lies ahead.

Sincerely yours,

Harry S. Truman

Honorable J. M. Johnson
Director
Office of Defense Transportation
Washington 25, D.C.

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Non-essential Railroads Offer Ideal Routes for Expressways

by WILLIAM B. POWELL, MEMBER, I. T. E.
Consulting Traffic Engineer

THE outstanding development during recent years in traffic engineering has been the broadening of the scope of the profession—a fact accepted not only by its own members, but also by technicians in other related fields, by most public authorities and by the press.

Gradual Growth of Profession

Originally the popular concept of a traffic engineer was that of a man standing on a street corner, stop watch in hand, counting the number and speed of passing vehicles. Later he was recognized as the designer of the system of traffic signals along a main thoroughfare which permitted progressive movement at a predetermined speed without interruption. Now his status has been established as an expert in the organization and operation of our vast highway transportation network for the safe and convenient movement of our population and its possessions at speeds never before attained. Beyond that the exigencies of modern mobile warfare have demanded that he deliver materiel and reinforcements to our fighting man at the fronts in the face of all the hazards of violent combat over a terrain where roads are mostly bomb-craters —a task which he has accomplished with bravery and distinction. Thus in the brief span of 25 years has this new branch of engineering attained recognition and maturity.

Recent evidence of this trend is the acceptance by city planners of their community of interest with, and dependence upon, traffic engineers. Many of the papers in the latest Proceedings of the Institute of Traffic Engineers were directly concerned with this relationship and its applications, especially in the design and location of limited access express highways, which are considered by both groups as the most promising hope for the solution of some of the pressing problems of transport in the large centers of population. While the traffic engineer is vainly struggling to abate the congestion and terminal difficulties of the business centers, knowing that the best he can do with existing facilities will not suffice to bring ultimate relief, he shares with the city planner the desire to devise some type of permanent structure that will divert enough of the highway load so that the essentially necessary local traffic will be adequately accommodated on the existing street pattern of the district.

Ideal Plan of Express Highway

Apparently, properly located expressways may solve their difficulties, but the formulation of such a plan, taking account of all the intricate conditions of modern city life, will require their closest skillful cooperation. For there is the risk that bad planning might convert such added highways into conduits to pour into the congested center an increased load that might blockade the area beyond endurance. In fact some of the plans already presented for expressways in the form of direct feeders seem to threaten exactly such dangerous results. The best thought of traffic engineers indicates that an encircling loop situated in the outskirts of a city and

completely by-passing the business center is the best general plan to be adopted. Such a loop will intercept all of the radial feeders toward the center and will afford opportunity for all traffic that wishes to transfer from one route to another to accomplish the exchange without impinging upon the business area at all. If this loop has one or two easy connections to parking facilities on the fringe of the commercial section, it will also invite much local traffic from the suburban districts to utilize its time-saving opportunities, thereby clearing to a considerable extent the streets within the loop.

However, the traffic engineer who attempts to design such an ideal system for any large city is confronted with the necessity of securing a right of way through solidly built blocks of commercial or residential properties, which he cannot hope to penetrate without condemnation proceedings that suggest prohibitive costs and inevitable organized opposition from citizens whose interests are affected. Before embarking upon such a difficult enterprise, it behooves him to join with the city planner in a careful scrutiny of the civic map for some alternative possibility, notably one that seems to have been overlooked in most discussions of this subject—the railroad layout.

Railroads Located Without Planning

Probably the most difficult element in the whole gamut of ideal city planning is the entrenched location of the railroads, sprawling in irrational networks all over the municipal landscape, leaving vast areas in blight and squalor along their lines. Perhaps their builders should not be too severely blamed for these conditions, since in those days there was no restraining hand of a city planner to curb their lust for favorable locations against their equally voracious competitors. But now every city must pay for this lack of foresight by its founders, whose conceptions were limited to a few main streets, sufficient for the meager needs of the era of horse-drawn transport, leaving the development of the surrounding country to the whims of real estate speculators and the avarice of railroad promoters.

Today there are some reasonable railroad executives who may concede confidentially that their rails might be relocated to much better advantage for present conditions, both for their own and the public's interests. Yet their life-long training to hold everything against all claimants will not permit them to yield a single foot without resistance. So utilization of the ground for urgently needed highway purposes will have to endure a long period of negotiation at best, or may even have to resort to legislative action at long last before being consummated.

Must Remove or Relocate Tracks

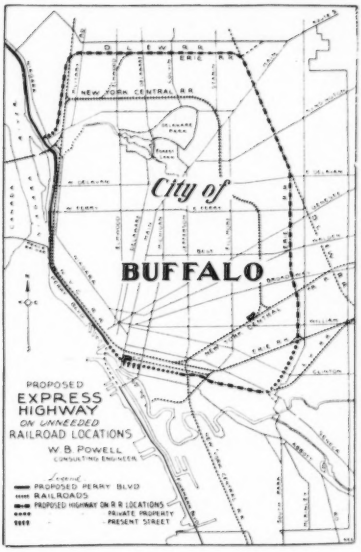
Hence it is imperative that the planner should start at once to secure removal or relocation of duplicated tracks in the many cases where their location may be advantageously utilized as the routes of express highways, especially since they are genarally already provided with grade separations from the streets and other railroads, and offer little prospect of resistance from neighboring citizens. Such a program has already been accomplished in some cities, notably in New York and Chicago, where elaborate motor ways have been substituted for unsightly railroads, or have been placed over them where the railroad was necessary to serve abutting property. Undoubtedly, similar opportunities exist in almost every city, awaiting utilization by an alert, far-sighted traffic engineer.

A typical example of such condi-

tions is found in the author's home city of Buffalo. Its basic street plan was originated by the celebrated French engineer, l'Enfant, who laid out a series of thoroughfares radiating from the center of the port at the western end of Lake Erie. Upon these were imposed rectangular grids of streets, making the final pattern resemble half of a gigantic cobweb, spreading eastward from the water front, which lies approximately in a north and south line extending from the lake along the east bank of the Niagara River. Long before the city had developed much beyond its central nucleus, a dozen railroads built an intricate labyrinth of lines in the surrounding territory, especially to the east and south, in competition for the best locations of terminals to handle the tremendous water-borne freight deposited in the port for trans-shipment because of the barrier to navigation at Niagara Falls. Freight interchanges were provided by local switching roads that wander through 16 scattered classification yards, while factories, slums, and blighted areas were interspersed between the tracks, with streets crossing in every direction. Necessarily, many of these facilities were duplications and as shipping conditions changed over the passing years, some trackage was no longer useful. Hence there is a marvelous chance for the large scale planning of a circular express highway, intercepting all of the radial arteries which now pour their traffic directly into the congested business center.

Outline Map Illustrates

The accompanying outline map shows how fortunately the railroads are located for the substitution of an express highway loop, in that there are three different roads operating lines from their yards in the east around through the northern residential section to the bridge to Canada in the



northwestern part of the city known as Black Rock. Two of them run close together for most of the distance, while the third is more direct and is arranged to accommodate four tracks although only two are in present use. Nevertheless this single inner loop of the N. Y. Central has ample capacity to handle all of the traffic of all three roads, so that the duplicated tracks of the Erie and Lackawanna could readily be replaced by a six or eight lane express highway, ideally located on a grade separated right-of-way without condemnation of private property except for a few connections (indicated by heavy broken line). From the south end of this right-of-way at the Erie main line near William Street, it would be necessary to construct a viaduct over the railroad yards to the line of the Lehigh whose embankment could be used to bring the highway in to the southern limit of the business district. The passenger services of the Lehigh

and Erie, which now use this track to enter the Lehigh Station at the foot of Main street, could be shifted to the more direct Erie line without difficulty.

Completing the Circuit

The Michigan Central railroad runs from the foot of Main Street to the Black Rock bridge along the waterfront, entailing a number of dangerous street crossings at grade, the elimination of which will be accomplished soon according to approved plans of the Grade Crossing and Terminal Commission for the relocation of the tracks. Combined with this plan is one devised by the City Planning Commission for the construction of a parallel express highway, known as Perry Boulevard, which will connect the Peace Bridge to Canada and the Grand Island bridges to Niagara Falls with the downtown area. This project also has been approved for early post-war construction (indicated on the map by a heavy unbroken line). Very short links over private property will serve to connect it with both ends of the proposed express highway loop to complete the circuit, thereby approaching the ideal as closely as existing conditions would permit with a minimum of dislocation and cost.

Effect Upon Local Traffic

Assuming that a multiple lane express highway loop is constructed on the railroad rights-of-way substantially as outlined, it would be separated in grade from all street crossings, mostly on overpasses, and it would be connected to all of the intercepted radiating avenues by ramps within the limits of the acquired properties in most cases. With added lanes for acceleration and deceleration, speeds up to 40 miles per hour could be maintained, so that the time consumed for passage from the most remote entrance to the business district would be reduced to very few minutes. Under such circumstances, all local traffic originating outside of the loop would undoubtedly utilize its facilities, besides which it would probably drain traffic from inside for a distance of at least a mile from its perimeter, because it would be quicker to drive the extra distance than to contend with the delays of ordinary street movement. Since it has been proved that about 90 per cent of the traffic approaching a city originates within the immediate locality of its suburbs, and since a large percentage of the population which uses individual automobile transportation lives in the outskirts, it is obvious that such a time-saving facility would attract the use of the great mass of local traffic, thereby affording tremendous relief to the overcrowded radial arteries. These would then have to accommodate only the inflow from the compact central portion of the city and the general distribution of local traffic over the area, for which purposes the present capacity would be quite adequate.

The unusual street pattern of Buffalo, already described as half of a cobweb, together with curtailment of approach from the south because of the extensive railroad and industrial developments, tend to concentrate all of the incoming traffic into the narrow limits of the north and east. This produces more than normal congestion on those sides of the business district, and increases the amount of cross movement for those whose destinations are on the opposite sides. On the other hand, the approach to this area from the proposed loop would be from the west side where it would be located within a few blocks of the civic center, so that a much more balanced distribution of traffic would result. In addition, it happens that there is a large area of blight on the west side area, well adapted to extensive provisions for parking on the fringe of the business district without

traversing it at all, or to a very limited extent.

Connections to State Thruways

While it is true that most of the traffic utilizing such a facility would be of local origin and destined for objectives in the center of the city, provisions should also be made to invite through traffic on the super-highways of the state to enter and enjoy the city with the least possible delay and discomfort. The proposed loop is well adapted for this purpose. Since it intercepts every entering highway, it will be possible to transfer from any one to any other without interference from local traffic, or it will be equally easy to reach the hotel area on the west side without the discomforts of city street driving. The principal present approach from the east is via Route N. Y. 5, which is located on Main Street at the northwest corner of the City. Access to the loop may be obtained at the crossing about a mile inside of the boundary, or preferably by a suggested connection from Kenmore Avenue, indicated by a diagonal dash line. However, it is probable that the new state thruway may be located on Sheridan Drive, a mile north of the city limits, in which case the line of the Erie branch to Niagara Falls, together with the abandoned line of the International Railway along side of it, would offer a splendid site for a connecting express highway. At the southwest corner of the loop, a connection across the Buffalo River by bridge or tunnel has been proposed to Fuhrmann Boulevard, which is now the principal outlet to the west along the south side of Lake Erie. But more recently a plan has been suggested to avoid such an expensive crossing structure by bringing in this route over a new express highway approximately parallel to, and west of, South Park Avenue, connecting with the proposed loop near its southwest corner, where the traffic from the other feeders in this direction would also be delivered. Finally, outlets to Canada via Peace Bridge or Niagara Falls are provided in the established plans for Perry Boulevard. Thus, the major thruways in all directions will contact the loop approximately at its corners for easy access to the City or to one another.

Prompt Action Indicated

With the promise of early action by the Federal and state authorities at the close of the war, no time should be lost by the traffic engineers and city planners in any community which wants to participate in the opportunity for express highway construction to relieve its congestion and expedite its traffic. The Buffalo City Planning Commission is aware of its responsibilities in this respect and is discussing various plans to accomplish these objectives. No city has a better chance to utilize its wasted railroad resources, but this can only be accomplished by unstinted effort, despite whatever opposition may be encountered in a project of such magnitude.

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SCIENTISTS AND TECHNOLOGISTS SEEN AS INTERDEPENDENT

Science, which is the fundamental inquiry into the nature of things, is useless until the technologist comes along and does something with the findings. It is equally true, however, that the technologist is helpless without the fundamental contributions of scientists. Thus in any well-planned scheme of research an attempt is made to balance between the search for underlying data and its fundamental correlation on the one hand, and the technical application on the other.—*Silicate P's & Q's.*

State of New York to Build and Pay for Urban Arterials in Cooperation with Cities

by CHARLES H. SELLS

Superintendent of the Department of Public Works, State of New York

Editor's Note: This is the first major step, taken by a State Government, to relieve congested Central Districts in urban areas.

NEW YORK STATE by legislation approved by Governor Dewey on April 10, 1945, has extended its state highway system to include the arterial routes through cities. This legislation, coupled with the provisions of the Federal Aid Highway Act of 1944, for the first time makes possible relief to the motorist from the traffic congestion, hazards, and bottlenecks of the urban areas. The State's interest in this problem arose from the failure of the "by-pass" to speed up movement in the congested areas. Surveys had indicated that over three quarters of the traffic in these areas wants to get into or out of the business center or heart of the cities.

Solution State Responsibility

Municipal financial stringency through eleven depression years prevented any attempt to solve this problem locally as the cities' revenue for such purposes is limited almost exclusively to real estate taxes. The origin of the traffic which caused the congestion was not confined within the city limits, and the problem was so generally widespread that the Legislature and the Governor were quick to realize that the solution is a State responsibility.

New Law's Provisions

The new law provides that the State shall assume the complete construction cost of these arterial routes including grading, drainage, pavements, bridges, grade crossing separation structures, and all other features necessary to provide a complete highway facility. In addition, the State will assume fifty percent of the cost of any additional right of way which may be required to provide an adequate solution of the problem. Marginal and residue lands may be developed as local recreational areas. All plans will be developed in cooperation with local governing boards, and the only expense which the city will be required to assume is the remaining fifty percent of the cost of right of way.

$100,000,000 for Arterials

Approximately one hundred million dollars out of the $840,000,000 five-year post-war construction program of the State Department of Public works will be devoted to the construction of these arterial routes. Surveys have started, preliminary studies are in process of preparation, and New York State is ready to start the solution of this problem as soon as war-imposed construction restrictions are removed.

FUNDS AVAILABLE FOR PREPARATION OF PUBLIC WORKS PLANS

Philip B. Fleming, Federal Works Administrator, has issued regulations for carrying into effect the provisions of Title V of the War Mobilization and Reconversion Act of 1944 which are contained in bulletin P2576 of the F.W.A. Bureau of Community Facilities dated May 1, 1945. The act authorizes the administrator to make advances of funds to non-Federal public agencies to assist in the plan preparation of their public works. The general purpose of the act is to encourage states, their agencies and the political sub-divisions to complete the plan preparation of specific public works and to take other steps necessary to enable them to proceed with construction when materials and manpower become available.

Applicants for Advances

Any non-Federal public agency may apply for an advance for plan preparation for any public work that it is authorized to construct and that it expects to construct within three years after the war. Public agencies include state governments and their agencies and political sub-divisions, such as cities, towns, townships, counties, school districts, water and sewer districts and other duly authorized public agencies.

Excerpts from Bulletin P-2576 F.W.A.

"Section 4 *Advances*

(a) The act authorizes assistance in the form of loans or advances of Federal funds for the plan preparation of specific public works.

(b) An advance shall not be required to be repaid until funds become available to the public agency to construct the specific public work for which an advance has been made and, therefore, until such funds are available, an advance shall not be deemed by the United States to be a debt or obligation within the meaning of any constitutional, statutory or other debt limitation.

(c) No interest charge shall be made for any advance.

(d) Advances shall not be approved to reimburse the applicant for any disbursements made or to defray any cost incurred prior to the approval of an application . . .

"Section 6 *Types of Public Works*

Applications for advances for the plan preparation of the following types of public works of states and other non-Federal public agencies are eligible under the provisions of the act:

(a) *Highways, Roads and Streets,* for which other Federal funds are not legally available, which shall consist of highways, roads and urban streets, including such items as culverts, drainage facilities, sidewalks, curbs and gutters, guard rails and guard walls, road and street lighting, traffic control facilities, roadside landscaping and other similar work . . .

(b) *Bridges, Viaducts and Grade Separations, for* which other Federal funds are not available, which shall consist of bridges, viaducts, grade separation structures, grade crossing eliminations, tunnels and other similar work.

The following types of public works are not eligible for assistance under the provisions of the act:

(j) *Public Housing Projects* of Federal, state or local housing agencies or authorities.

(k) *Federal Projects* of Federal departments, agencies and instrumentalities.

(l) *Federal-Aid and State Highway Projects* of the Federal Public Roads Administration and the state highway departments.

"Section 7 *Conformity to Over-All Plan*

Each application for an advance . . . shall contain evidence that the public work to be planned conforms to an over-all state, local or regional plan approved by competent state, local or regional authority. Where no legally authorized over-all planning agency exists, evidence of the approval of the proposed public work by the authority having jurisdiction thereof shall be required.

"Section 12 *Repayment of Advances*

Each advance made for plan preparation

shall be repaid in full without interest by the applicant out of the first funds that become available to it from any source for the construction of the specific public work so planned."

The regulations contained in F.W.A. bulletin P-2576 also require applicants to keep records of all costs and submit reports, when requested to do so, to the F.W.A. Bureau.

Application forms may be obtained from and shall be submitted to the division offices of the Bureau of Community Facilities, Federal Works Agency. The following is the present location of each division office of the bureau:

Div. No.	ADDRESS OF DIVISION OFFICE	STATES UNDER EACH DIVISION
1	Division Engineer Bureau of Community Facilities Federal Works Agency 101 Park Avenue New York 17, New York	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey
2	Division Engineer Bureau of Community Facilities Federal Works Agency Lemon Building Washington 25, D. C.	Pennsylvania, Maryland, Delaware Virginia, West Virginia, District of Columbia
3	Division Engineer Bureau of Community Facilities Federal Works Agency 20 Fifth Street, N. W. Atlanta, Georgia	North Carolina, South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi
4	Division Engineer Bureau of Community Facilities Federal Works Agency 1506 Civic Opera Building 20 N. Wacker Drive Chicago 6, Illinois	Ohio, Kentucky, Indiana, Michigan, Illinois, Wisconsin
5	Division Engineer Bureau of Community Facilities Federal Works Agency City Hall & County Court House St. Paul 2, Minnesota	Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
6	Division Engineer Bureau of Community Facilities Federal Works Agency 710 Electric Building Fort Worth 2, Texas	Arkansas, Louisiana, Texas, Oklahoma
7	Division Engineer Bureau of Community Facilities Federal Works Agency 2223 Fulton Street Berkeley 1, California	Nevada, Arizona, California, Wyoming, Colorado, Utah, New Mexico, Hawaii
8	Division Engineer Bureau of Community Facilities Federal Works Agency Room 511, 618 Second Avenue Seattle 4, Washington	Montana, Idaho, Washington, Oregon, Alaska

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84,000,000 GALLONS OF GAS NEEDED DAILY UP TO V-E DAY

The United States military demands for gasoline reached 34,000,000 gallons daily in 1944, an increase of 433 per cent in the three years since Pearl Harbor. Combined military and civilian demand reached 84,000,000 gallons daily before V-E Day, despite the fact that civilian use was strictly curtailed. But, of course, the essential work of the country must go on; and gasoline, being the prime source of mobile energy, its consumption even in wartime necessarily remains high.—*Highway Research Abstracts.*

Transit and Urban Expressways

by LESLIE WILLIAMS, ASSOC., I. T. E.
City Planning Engineer, American Transit Association

This article is taken from a paper presented by Mr. Williams before the 2nd Annual Conference of the Eno Foundation for Traffic Control, Inc.

WHAT place should public transit be given in the location and design of the urban segments of the interstate system so that mass transportation can play its proper part in the moving of people into, out of and within urban areas? This is a question of timely importance demanding a realistic and straightforward response.

Approximately 27,000,000,000 passengers were transported in public carriers in the United States in 1944. Eighty-six per cent of these passengers were carried in local transit vehicles—motor buses, street cars, rapid transit and trolley coaches.

Type of Vehicle	*Passengers*
Intraurban Motor Buses	9,646,000,000
Street Cars	9,516,000,000
Subways and Els	2,621,000,000
Trolley Coaches	1,234,000,000
Taxicabs	1,616,000,000
Interurban Motor Buses	1,162,000,000
Class I—Railroads	595,000,000
Commutation	318,000,000
Scheduled Air Lines	4,000,000
Total	26,712,000,000

The first three months of 1945 show a continued upward trend in public transit riding despite an estimated 7.7 per cent increase in private motor vehicle traffic in March, 1945, over March, 1944.

Authorities estimate that local transit riding five years hence will be between the 1941 and 1942 levels, which averaged 16,000,000,000 passengers.

Big Loads for Rubber Tires

Motor buses and trolley coaches alone will probably carry 13,000,000,000 of the post-war transit passengers.

In view of the expected transit riding, traffic officials should plan for a relatively high level of transit riding in the first post-war decade, at least 50 per cent of the total passenger travel within competitive urban areas.

There are a number of factors supporting the above conclusions.

Urban Population Growing Fast

Our urban population is growing at a faster rate than that of the nation. Smaller cities are becoming more industrialized and are increasing in population. As these cities grow, public transit becomes relatively more important as a means of satisfying the daily necessity travel needs of the people.

Revenue transit rides per capita of population, 1944:

Cities over 1,000,000	423
Cities 500,000 to 1,000,000	420
Cities 250,000 to 500,000	372
Cities 100,000 to 250,000	320
Cities 50,000 to 100,000	254
Cities 10,000 to 50,000	118

A primary objective of our nation is to maintain a high level of business activity, employment and purchasing power after the war. High levels of business activity have been shown by authorities to be reflected in a high level of transit riding.

While the automobile is recognized as a competitor of public transit, nevertheless, two major elements will play a part in changing the pre-war trend. First, the transit industry will make every effort to provide through improved service, modern equipment and basic planning, a public transit system radically different from pre-war practice. Second, automobiles will not increase as fast in the years to come as they did in the past.

25 P.C. Rise Forecast

Between 1920 and 1940, automobiles increased almost 250 per cent, but in the next 20 years, the increase is not expected to be more than 25 per cent over 1940. This means that a demand for automobiles is levelling off and approaching the saturation point.

In 1920, there were 13 persons for every automobile. In 1940, there were 4.8 per automobile. It is questionable if the ratio in 1965 will be 4 persons per automobile—a relatively small gain compared to the era, 1920 - 1940.

While it is granted that each automobile will probably travel more miles per year than was the case in the past; the streets of our cities, especially the larger ones, had reached their vehicular traffic saturation point, according to leading traffic authorities.

In March of this year, a report was issued by the Post-war Highway Commission of the Commonwealth of Massachusetts in which its Committee of Engineers, composed of prominent and capable public works, highway, traffic and city planning engineers, stated that while travel increased in the Metropolitan Boston District over 100 per cent from 1927 to 1941, there would be an increase of only 50 per cent in motor vehicle miles throughout the whole State of Massachusetts by 1965.

Reached Saturation Point

In this same report, it is stated that during 1941 traffic in Boston had reached its saturation point. The congestion reached such a point at times that the daily rush hour was extended to a 3- and 4-hour period.

It seems reasonable to conclude from these findings that only a small percentage of the Massachusetts Statewide 50 per cent increase in motor vehicle mileage will be realized by private automobiles within the City of Boston in the first post-war decade.

Traffic engineers are aware that street traffic congestion was strangling our cities in pre-war days. They poured forth their tragic story of the enormous economic losses from congestion and the staggering toll in lives from motor vehicle accidents. In 1937, it was estimated that the losses resulting from traffic deaths, personal injuries and property damage amounted to $1,700,000,000, with an equal amount of money lost through street vehicular traffic congestion.

Staggered Hours Cut Toll

Traffic engineers also know that when working hours were staggered, street traffic congestion and accidents were materially reduced, despite the fact that more people than ever before were being carried within urban areas. Staggered working hours proved to be the most effective and least expensive traffic control measure yet devised to move large volumes of people safely and expeditiously.

Perhaps no small part of this traffic release is due to a change in riding to larger capacity vehicles such as motor buses, trolley coaches and street cars.

It might be argued that, since highway engineers describe our streets and main highways as worn out, obsolete and obviously inadequate and unsafe, the proposed street and highway construction program will rectify this situation immediately after the war and provide free flowing facilities for whatever mode of transportation a man wishes to choose.

To date, no State Highway Department has a comprehensive metropolitan thoroughfare plan or a comprehensive highway policy for financing such a program.

Federal Funds For Urban Use

In January, 1944, the National Interregional Highway Committee recommended that approximately one-half of an annual appropriation of

$750,000,000 be allocated to main urban highways to bring them up to reasonable standards.

Congress in December, 1944, set aside $125,000,000 toward improving the urban segments of the Interstate Highway System in 543 cities of 10,000 population and over. These urban segments of the Interstate System will constitute a little over one per cent of our total street mileage.

Even with state matching of funds and with municipal and county contributions of rights-of-way, it would probably take two decades to bring this small but important percentage of urban street mileage up to recognized standards.

To Remain "Inadequate"

We must, therefore, content ourselves with the fact that the major portion of our "inadequate" streets are relatively permanent and only an "inadequate" system of limited-access highways is economically feasible for some time to come. This means that 99 per cent of our street mileage will remain with us, except for minor changes. Traffic engineers will find themselves shouldered with the practical task of obtaining the maximum of transportation from existing streets and highways.

Metropolitan Planning: Students of urbanism recognize that the urban segments of the Interstate Highway System will be factors of special metropolitan significance, and cannot be viewed except as part of the *whole* urban transportation and metropolitan land-use pattern.

The indiscriminate and haphazard development of metropolitan areas was stressed by the Interregional Highway Committee, and it was pointed out that past road building practices had facilitated urban decentralization to a point economically unjustified.

Many of our large cities owe their origin and growth to a crossing of routes where a break in traffic and business transactions took place.

It is only natural, however, that when the traffic pours into a site faster than the site can adjust itself to the needs of traffic, then accidents and congestion result.

The phenomenal increase in numbers of automobiles could not help but create accidents and congestion, but in our enthusiasm to rid these route crossings of traffic frictions, all kinds of schemes were devised and applied to eliminate the accidents and relieve the congestion.

Successful, But —

In some cases the operation was successful but the patient died, because the site was destroyed as a future community nucleus. The cloverleaf, for example, destroys that "break in traffic" which was the reason for being of many of our communities and which is inherent in every intersection and must be preserved if at all possible.

A study of aerial photographs showing the land uses that have taken place within one-half mile radius of a cloverleaf separation structure and the land pattern within the same distance of a transit transfer station clearly shows the effect of the existence of a "break in traffic."

The community-building force of public transit, where passengers interchange from one type of vehicle or service to another is provided in ample evidence in such a comparison as mentioned above.

Ask yourself the question—Why would anyone wish to stop his automobile at a cloverleaf grade separation, purchase a lot, build a house and raise children within walking distance of the cloverleaf?

There is ample evidence available to prove the decentralizing force of free-

flowing automobile express parkways, where there are no facilities for changing one's mode of travel. The expressways of tomorrow can, if properly designed and equipped with the necessary transit transfer stations and turnouts, promote orderly and sound, instead of haphazard and unsound, urban development.

Omniways: Studies have shown that a combined system of public passenger and private passenger expressways, where feasible, is much cheaper and more serviceable than building separate passenger transportation systems, such as a subway and an express parkway.

The recent Detroit report on transit and expressways estimates a saving on public transit subway construction alone of approximately $35,000,000 by building a cross-town transit highway combining rapid transit in the central mall of a dual highway.

Savings Per Mile

Authorities claim a saving of $2,500,000 to $4,500,000 a mile by incorporating rapid transit in the central mall of an express highway as compared with building a conventional subway—enough to construct the highway itself.

Other estimates have been made which show that it would cost the average motorist $500 a mile for each urban mile of parkway if used to capacity, and more if not. On the other hand, it has been estimated that by operating rapid transit cars as trains in the central mall of such an express parkway with the proper transfer stations, the cost would be reduced to $50 per mile per passenger.

Equal economies can be made in the provision of intown terminals. In New York, plans are under way for the construction of a union bus terminal with a capacity of 30,000 persons an hour in 735 motor buses.

Problem Of Storage

Traffic engineers know the space that would be required to store the automobiles of 30,000 bus passengers if proper transit facilities are not provided and automobiles are used instead. They also know that it would take several hours to move the automobiles of 30,000 passengers in and out of garages.

At a normal passenger loading of automobiles and at 250 sq. ft. of parking space per automobile, it would require nine mid-town Manhattan blocks (each 660′ x 250′) of four-story garages to accommodate the automobiles of these 30,000 peak hour motor bus passengers.

Highway Determinants: It is interesting to note that the National Interregional Highway Committee based the recommended Interregional System on determinants that would have been used if the primary purpose of the study had been to provide the greatest benefit to the greatest number of transit passengers.

The Interregional System was selected to serve 82.6 per cent of the total urban population of the nation; 83 per cent of the total value of all manufacturing located in cities of 10,000 population or over; the most important war industry areas; ports of embarkation, military and naval establishments; the areas of the greatest post-war employment relief; the principal routes of the strategic highway network, and the routes of heaviest traffic, especially where the greatest volumes of motor truck and passenger car travel exist.

Committee Recognized Transit's Role

The National Interregional Highway Committee must have recognized that public transit was going to play a primary part in achieving the objectives of the urban segments of the System, for Commissioner Thomas H. MacDonald of the Public Roads Administration recently wrote that "The interests of public transportation and the over-all street and highway trans-

portation can never be divergent. They must always be parallel. Indeed, in many cases they are coincident."

It, therefore, seems reasonable to assume that the urban segments of the Interstate System will be based on the same determinants as was the System itself, thus bringing the greatest benefits to the greatest number, if designed primarily for *intracity* highway passenger and freight needs.

Design Standards: The basic design standards set forth in the Interregional report promote the incorporation of adequate and proper transit facilities.

When the transit industry suggested that the Federal-Aid Highway Act of 1944 contain provisions specifically permitting public transit to render its maximum service on limited-access highways, it was pointed out by highway officials that express operation of transit vehicles on these expressways was not a matter of principle but one of design detail.

Would Deny Use By Large Numbers

The omission of the transit "detail" can, in effect, deny full use of such expressways to large numbers of workers, shoppers and others who daily rely upon good, cheap and speedy transportation.

The basic standards set forth in the Interregional Highway Report provide amply for the incorporation of transit facilities.

A depressed right-of-way is preferred wherever possible. Design speeds over 50 miles an hour on the urban segments are considered impracticable. Three per cent grades are favored and three 12-foot lanes in each direction required for an average daily traffic of 20,000 vehicles or more.

Buses would not retard the flow of other vehicles on these highways unless stopped in the moving lanes.

A medial strip of flexible width is recommended where needed and this would in no way obstruct the incorporation of rails for rapid transit.

Paralleling the through-lanes, are to be 10-foot lanes of contrasting color. These 10-foot lanes are to be reserved for temporary accommodation of vehicles. While 10 feet would be too narrow for bus stops, no obstacle to the proper provision of bus turnouts is evident because the basic standards recommend a broad and wide right-of-way with flat shoulders that could easily provide the proper bus turnouts with waiting stations, stairways to the local street and other traffic safety devices permitting the safe transfer and interchange of passengers without traversing at grade the roadways of the cross streets.

These highways are to be limited-access highways with no grade crossings at intersections, thus permitting uninterrupted express movement and not interfering with local traffic.

Must Favor Adjacent Property

The location of these highways, it is stressed, must affect adjacent property as favorably as possible. This means promoting the kind of land-use development which produces the best living environment.

The outlook for transit's place in the post-war express highway program appears bright; yet a broad interpretation of the following standard is necessary, otherwise express public transportation will be denied to many people on these public highways.

> "Bus stops shall be prohibited on all urban sections of the Interregional System. Access connections for bus stops on the Interregional Highways shall be designed to the same standards as other access connections."

The responsibility for providing the proper transit facilities rests with the individual State Highway Departments; but final approval rests with the Public Roads Administration.

Best results will be obtained when the local transit, traffic and planning engineers have cooperated with the state highway engineers in designing

the transit facilities of these highways before submitting them to Public Roads Administration.

Designs Already Prepared

A number of designs for urban highways have already been prepared with "provisions" for public transit, which consist of buses stopping on service roads at the cross street grade intersection.

It seems, therefore, pertinent and timely for the transit industry to set forth its needs and requirements for the safe and expeditious operation of express transit service on the urban segments of the Interstate Highway System.

There are generally two types of express service that would be demanded on these limited-access highways. One, the non-stop service from an outlying community to a concentrated district within the metropolitan area; another, express service with intermediate stops to pick up and let off passengers along the way to and from points of concentration.

It will be recalled that free-wheel rubber-tired vehicles today carry the bulk of our daily travel, but it has been estimated that when motor bus and trolley coach headways reach 180 to 200 vehicles per hour, then consideration should be given to the incorporation of rail facilities for the operation for PCC cars.

Proper Facilities Vital

Proper facilities must therefore be provided within post-war expressways to enable free-wheel vehicles to deliver their maximum service.

An example of the non-stop type of bus service is that provided on the Outer Drive in Chicago where, during the maximum peak travel hour, 7000 bus passengers traveled outbound from the central business district in motor buses, whereas during the same hour, 3000 passengers traveled outbound in 1780 automobiles in the maximum automobile lane. It may readily be seen that buses and automobiles using the same lane will carry approximately three times the number of people that an express automobile lane can transport.

These figures fall into insignificance when compared with the demands for moving people during the peak hour over ordinary streets. In one large midwestern city in the maximum rush hour, approximately 26,000 people are carried out of town on one major street.

In any case, non-stop express bus service from outlying areas over expressways would constitute only a small part of the express service and therefore express service with intermediate stops will constitute the major problem.

A Cardinal Principle

One of the cardinal principles of traffic safety is the segregation of high-speed through traffic from slow-moving local vehicles.

Apparently, the current method for providing the more important high-speed transit service along expressways is to require buses to leave the express roadway by way of an up-ramp, stop near the cross street on the local service road, discharge and pick up passengers, then proceed at grade across the cross-town arterial, stop again, pick up and discharge passengers and finally accelerate on the down-ramp to merge with the high-speed traffic on the expressway

Such a scheme of motor bus operation, especially with important cross-town arterials approximately one-half mile apart and buses scheduled at a high frequency, would be a signal for all traffic safety and police officials to begin red-tabbing these crossings as "high-accident frequency locations" and rating them a high priority for special channelization, signing, marking and signal and lighting treatment.

As an alternative, it has been sug-

gested that express bus service operate over the "direct" and "parallel" local service roads flanking the express highway. These local service roads are not generally direct nor parallel to the expressway. Mixing express and local traffic on service roads, would violate the basic design standard set forth in the Interregional Highway Committee Report, namely, that these highways must affect adjacent property as favorably as possible. If such express bus service could operate more expeditiously on the local service roads than on the express highway, it would be an indictment of the expressway itself.

Transit Bus Turnouts

Modern traffic engineering design calls for properly incorporated transit bus turnouts with adequate accelerating and decelerating lanes, turnout roadways 20 feet wide, islands equipped with non-mountable barriers separating the turnout from the express roadways and preventing pedestrians from crossing the roadways. Distinct pavement coloring, adequate signing, pavement marking and lighting, and all of the essentials in keeping with the latest practice in urban transportation engineering would be required, including properly paved and covered loading and unloading platforms, stairways or escalators, and sidewalks under the cross street, so designed as to eliminate pedestrian accidents on the upper cross-town arterials when transferring from express to local vehicles.

There are a number of examples of motor buses stopping on the roadways of high-speed highways to pick up and let off passengers. There are other examples of public transit facilities patched into the traffic structure.

Numerous Guides

There is no need for allowing the same deficiencies to occur in our post-war urban expressways, for there are examples of bus stops in New York, Detroit, and Washington, to guide designers in providing adequate bus turnouts.

The latest and most modern are those planned for the Los Angeles Parkway System and approved by the California Highway Department.

The Post-war Traffic Planning Committee of ITE in its report on Traffic Planning and Design Principles for Modern Urban Traffic Facilities, has this to say about bus stops not incorporated within the expressway right-of-way, "There is an obvious and natural disadvantage in having express bus stops on the service roads at intersecting streets in that one important element of the express traffic stream is brought into conflict with street traffic, thus creating anew the very situation the expressway was intended to eliminate. This is especially true when buses are required to cross intersecting streets at grades."

A special committee of the American Institute of Planners is in the process of preparing data on accelerating and decelerating lanes, traffic islands, turnout roadways, etc., with cross-sections and plans to aid the practicing city planner in providing the maximum of cooperation in the post-war highway program.

Policy On Design

The Public Roads Administration Design Division is also in the process of preparing a policy on expressway design and undoubtedly will provide assistance and guidance to those preparing plans for proper expressway transit facilities.

The American Transit Association has, with the cooperation of highway, traffic and planning engineers, taken the initiative, as it should, in this matter of the incorporation of functional transit turnouts and transfer stations in urban expressways.

Transit leaders consider bus turnouts designed into the freeway as be-

ing in accordance with the best transit operating practice. It seems best, therefore, to provide, where required, the proper transit needs.

The frequency of bus turnouts would depend upon the location of existing and expected neighborhood and community centers, large industrial plants, housing projects and other places of public gathering located with reference to the expressways.

Should Be Well-Spaced

In practically no cases should bus turnouts be located within one-half mile of each other. The turnouts need not necessarily be built into the grade-separated structure but could be placed before, after or midway between grade separations, but based on sound studies of reasonable walking distances for the particular locale. The prime objective should be to locate and design such transfer stations and turnouts so that they would provide the maximum of convenience and safety to the public when using public transportation.

Not only intracity and suburban buses would use the turnouts but also intercity buses, and in some cases, arrangements would undoubtedly be made for their use by taxis and private passenger automobiles desiring to discharge passengers.

One of the most effective functions that the urban segments of the Interstate Highway System can perform is that of acting as collectors and distributors of metropolitan traffic as it moves back and forth within the highly developed urban area. When the urban segments cross the city, as they must, these functions will become paramount, and every effort should be made to see that each type of passenger and freight carrier is given the best opportunity to demonstrate its best service. Public transit is a type of service essential to every community through which the Interstate System passes.

Many Advantages

Adequately designed bus stops have the advantage of confining express buses to express roadways, segregating express traffic from local traffic and eliminating conflicting terminal functions from the traffic stream. Loading and unloading of passengers is placed in a terminal, and pedestrian movements are protected by making it more convenient for the pedestrian to transfer from one vehicle to another without crossing moving traffic at grade. Bus stops properly designed will not impede expressway traffic and they should reduce the necessity for access ramps along freeways.

Great benefits are derived by the incorporation of transit facilities within urban expressways. Reduced time is required between origin and destination. More comfort is provided a greater number of people. More people have the opportunity of riding in a less hazardous mode of transportation over modern highways at great savings to the public.

Adequate transit is needed to relieve post-war highway congestion and accidents. There is insufficient money to build all the highways that are needed for many years to come. Traffic officials must, therefore, see to it not only that modern highways are properly designed, but also that existing streets be given priority treatment. Aside from facilitating the movement of people and goods this will promote greater accessibility within our metropolitan areas and aid orderly urban development. Orderly development will make it profitable to work, live, bring up a family, own property and do business in the cities we build for tomorrow.

The transit industry is in a better position today to provide modern, comfortable, convenient, speedy and economical transportation service.

Every encouragement should be given it to bring about a post-war public transportation service, unexcelled and undreamed of in pre-war days.

It seems only reasonable to conclude that the cost of providing the fixed structure and the right-of-way to achieve unexcelled public transportation should be financed, as are streets and highways, through taxation.

Metropolitan Agency Necessary

To realize the fullest and most comprehensive plan of moving people and goods in urban areas, it will probably be necessary to establish some form of metropolitan transportation agency with powers to plan for the means of moving its people and goods in cooperation with other planning agencies at other levels of government.

The war has brought home to public officials, businessmen, civic leaders and the public a fuller realization of the importance of public transit in our urban economy. Therefore, it behooves traffic engineers to lay plans that have the maximum of safety and still move with facility the largest number of people and the greatest volume of goods at a minimum of cost to the public.

The traffic engineer has created a reputation for providing practical solutions at minimum expense. It seems unlikely that he will stand by and permit himself to be forced into patching up ill-designed highways when, with a little traffic-planning before construction proper facilities could be built into the original structure at a great public saving.

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South Bend Modernizes Signs

Ernest H. Miller (Jun.), City Traffic Engineer, South Bend, Ind., reports that several years ago the city undertook a project of traffic signal modernization and standardization, and that to date 12 unwarranted traffic signals have been removed and 14 overhead traffic signals replaced with three-lens curb type signals. At five intersections two-lens curb type signals were replaced with three-lens curb type signals. Signals at five other intersections were re-located or additional signal indications were added.

The traffic signal modernization program is complete except for those signals at 29 intersections in the central business area. At present in the central district, the two-lens curb type operate from one central control.

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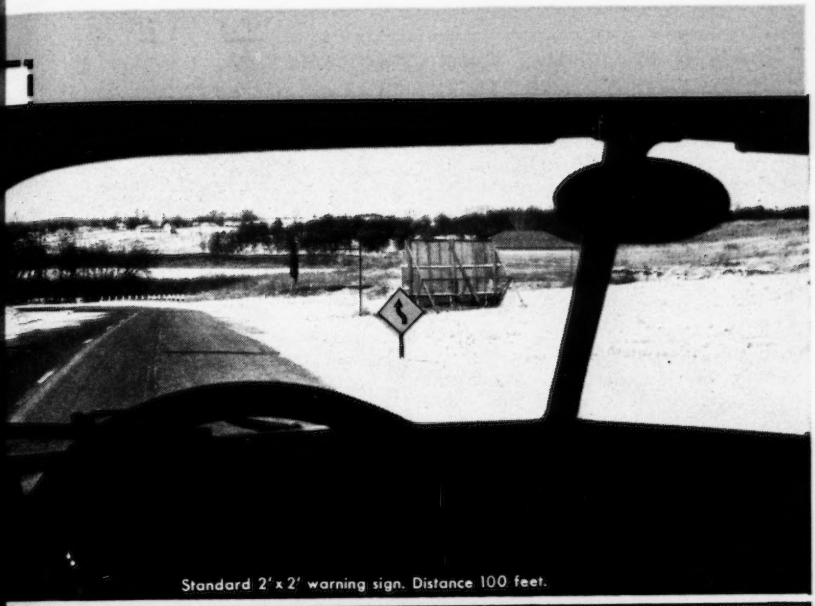
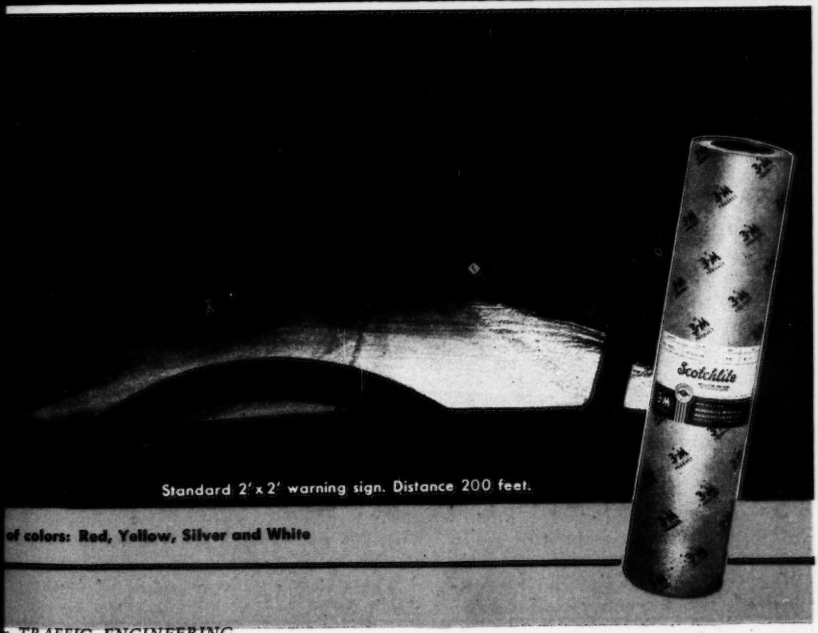


Standard 2' x 2' warning sign. Distance 100 feet.



Standard 2' x 2' warning sign. Distance 200 feet.

of colors: Red, Yellow, Silver and White

TRAFFIC PLANNING AND COORDINATION URGED AT SECOND CONNECTICUT TRAFFIC CONFERENCE

Forty public officials from nearly every large urban area in Connecticut convened June 20-21 at the Bureau of Highway Traffic, Yale University, for the second Connecticut Traffic Engineering Conference.

Mr. William L. Groth, Safety Engineer of Virginia State Police, the key speaker at the morning session, emphasized the importance of coordinating engineering and enforcement functions in order to effectively deal with problems of traffic accidents and congestion. Mr. Groth stated that police have inherited the full responsibility in most cities for traffic control and regulation and that engineers have often been prone to neglect operations.

Training and Experience Important

"The public is rapidly becoming perturbed with traffic accidents and the irritation of congestion," stated Mr. Groth. "Engineers can no longer be content with construction and physical maintenance of roadways; they must assist in the operation of the roadways. By basic training and experience engineers are particularly qualified to analyze complicated traffic problems. Their analysis will inevitably lead to better traffic regulation and to the planning of better route and terminal facilities. These engineering abilities should be recognized by executive heads of city governments and the proper steps taken to fully utilize them. It must be fully understood, however, that such action would in no way overlap or weaken the traffic duties of police, but, rather, would augment and extend the functions of enforcement agencies."

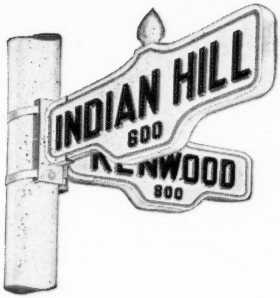
In his discussion Mr. Groth pointed out the extreme importance of training as well as experience for both police and traffic engineers. He emphasized the importance of having each group fully understand the functions and responsibilities of the other. Mr. Groth further suggested that in many states the smaller urban areas cannot justifiably employ full-time traffic engineers, and accordingly, because of the importance of state highways in such areas, such services are being increasingly rendered by the Highway Department through bureaus of traffic engineering.

Afternoon Session

At the afternoon session of the Conference on Wednesday, Mr. Roy Jorgensen, Director of Highway Planning of the Connecticut State Highway Department discussed the activities of the highway department in planning for state routes through and around urban areas. Mr. Peter P. Hale, City Planner from the New Haven City Planning Commission, spoke from the viewpoint of the urban area in addressing the group on "Practical Traffic Considerations in New Haven's City Plan." A panel of traffic experts discussed the practical means for effective community action in local, state and highway traffic problems. The panel led by Mr. Wilbur S. Smith, Associate Director of Yale Bureau of Highway Traffic, included Henry P. Clark, Chief of Police, New Haven, Connecticut; W. Howard Sharpe, Engineer of Highway Control, Connecticut State Highway Department; Richard Siver, Traffic Engineer, National Conservation Bureau; and Mr. Groth.

In opening the conference Mr. Theodore M. Matson, Director of the Yale Bureau of Highway Traffic, and Mr. William M. Greene, Director of the Connecticut Highway Safety Commission, emphasized the importance of planning for effective regulation and control now and in the immediate post-war period.

The Conference was sponsored by the Yale Bureau of Highway Traffic and the Connecticut Highway Safety Commission.



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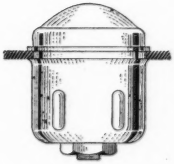

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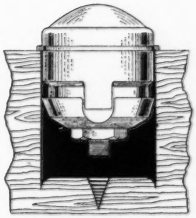

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THE OLDEST long-distance highway on record spanned a distance of about 1,755 miles, across southwest Asia and Asia Minor, between the Persian Gulf and the Mediterranean Sea. It was named THE ROYAL ROAD by the Persians after their conquest of Mesopotamia in the sixth century before Christ. Prior to that time, however, the route had been in use for centuries and perhaps milleniums. Coming into existence possibly as a path for wild animals and peoples migrating westward to obtain sustenance in their escape from the death-dealing droughts of the Near East, the road was traveled successively by waves of nomads and later by horse-drawn chariots and riders mounted on elephants bound on errands of conquest, trade, communication, and mercy. Throughout the ages kingdoms, principalities and powers along THE ROYAL ROAD have soared to the zenith of their glory and then plunged downward into oblivion. National boundaries have been established, shifted and erased, and an unending stream of diverse peoples have trodden its tortuous course—Babylonians, Assyrians, Chaldeans, Egyptians, Cretans, Hittites, Phoenecians, Lydians, Phrygians, Medes, Persians, Greeks and Romans. Through all these vast changes the general course of the great thoroughfare remained undisturbed.

Path to Civilization

Over its beaten surface were transmitted the discoveries which made our civilization possible. The invention of the wheel and axle, the domestication of the horse, the true arch later used in bridges, possibly the first pavements, and the discovery of silver originated in the East. Silver money seems to have been made first in Asia. It became the medium of exchange that supplanted the primitive system of barter and made possible a lucrative trade along THE ROYAL ROAD. Hittite business documents discovered near Caesarea Mazaca, dating back to 2,000 B. C., attest to these activities. Luxurious caravansaries (inns) as well as post-rider stations lined the route. Probably swift camels were employed in the famous postal system invented by the Persians.

Began at Susa

THE ROYAL ROAD began at Susa, situated on the navigable river Choaspes flowing into the Persian Gulf. Here is located the tomb of Daniel, the Hebrew prophet who lived thousands of years after the city was built allegedly by Memnon, King of Ethiopia. From this oldest Babylonian city THE ROYAL ROAD wound northwestward to Arbela, one of the cities of Dungi (2,450 B. C.), King of Ur, Sumer and Akkad. Thence the heavy black line, indicating THE ROYAL ROAD on the accompanying map, extends westward to Nineveh (opposite Mosul, the oil center), the ancient capital of Sennacherib, King of Assyria (705-681 B. C.) who left a memorial inscribed: "ROYAL ROAD. LET NO MAN DECREASE IT." His last instructions were that any person whose property encroached

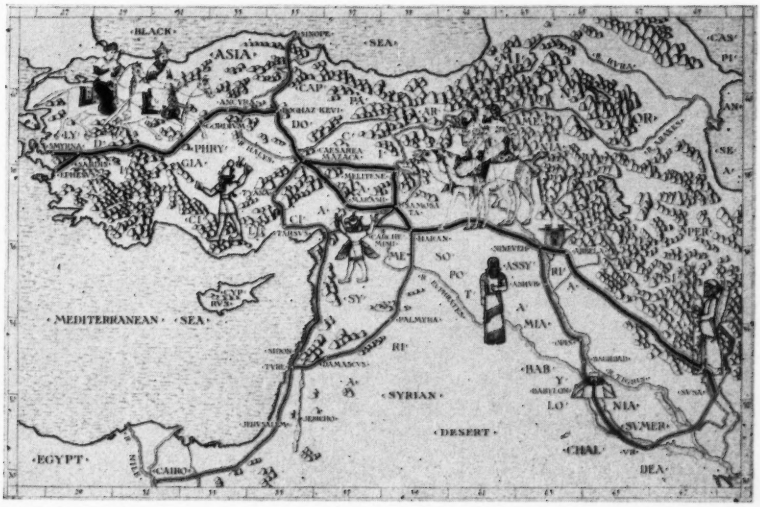
upon the 78-foot width of the main street of the city, along which passed THE ROYAL ROAD, should be put to death by impalation upon a pole erected in front of his house. It was less expensive in those days, in money at least, to maintain a freeway unchoked by abutting property.

Route of the Highway

From Nineveh the highway ran westerly to Harran, a caravansary city at the junction with the road leading to Canaan, where Abraham and his father Terah stopped as related in the Book of Genesis: Thence THE ROYAL ROAD crossed the Euphrates River at Samosata (modern Samsat) which, according to Strabo, the geographer, was the starting point of the great caravan route to India. There the highway divided and then came together again at Caesarea Mazaca (modern Kayseri), an important center on the cross road connecting the Black and Mediterranean Seas. Thence travelers journeyed northwestward to Boghaz Keui, the time-honored capital of the Hittite kings. Westerly of there at Ancyra (modern Ankara) have been exhumed carvings indicating that the Hittites made the first organized effort to improve THE ROYAL ROAD. At Gordium Alexander the Great severed with one stroke of his sword the intricate knot devised by Gordius to fasten an ox yoke to the tongue of a wagon. The termini of the road were Smyrna and Ephesus, the latter the great port dominating the West Coast of Asia Minor, where in the days of Saint Paul the populace raised such a commotion about their goddess Diana.

The overall travel time from end to end of THE ROYAL ROAD, according to Herodotus, the father of history, writing about 457 B. C., was three months and three days, an average journey of nearly 19 miles a day.

—*American Highways.*



Lifting the Face of the Traffic Signs

by Ross C. Harger, Assoc., I. T. E.
Director, Traffic Engineering Bureau, City of Detroit

Detroit, like most other governmental agencies, has been faced with a war time problem of trying to properly control traffic without being able to secure many of the necessary materials with which to make the "tools" for such traffic control. Steel for the manufacture of traffic signs is one of the items that has been especially difficult to obtain. It has, therefore, been necessary in many instances to reclaim old steel which has already seen many years of service.

Assuming that most other cities are in the same position as Detroit with regard to the condition of their traffic signs, many of the signs brought in from the streets for reclamation will be found to be non-standard in both shape and color. Therefore, whenever possible, it becomes good policy to standardize these signs at the same time the revamping is taking place. Since in all cities the parking sign is the most common and comprises a large majority of the total signs in use, a typical parking sign has been chosen as the example for this discussion.

Signs of Sheet Steel

In the City of Detroit all parking signs are made of flat sheet steel and many of the following methods and treatments described would not be applicable to an embossed sign. However, other similar methods could be easily adopted so that the end result would be the same.

In Figure 1, one of the old non-standard parking signs is shown about to be removed from the street. After

Figure 1—Old signs come down.

this sign is brought into the shop the first step is to remove all the old paint. The usual method of paint stripping is employed whereby the sign is immersed in a hot caustic bath until all of it has been removed. There are many good products on the market for preparing such a solution. The one employed here is available in powder form and is dissolved in water in the ratio of approximately 21 pounds to 60 gallons of water. At boiling temperature, three minutes are required for the complete stripping of a sign or group of signs. After the sign has been cleaned the next step is to reshape it to meet Federal standards. If

the necessary dies are available, the best method is to stamp the sign. However, in most cases this will not be possible and methods similar to those employed in Detroit will be required. A rotary shear is used for this purpose with very good results.

Most signs that have been a considerable amount of service are usually rusted to some extent and of course it is necessary to remove this rust before new paint may be applied. Wire brushing is the most common method used and since hand brushing is too laborious, mechanical means should be devised.

After this operation has been completed the sign may then be Bonderized or Parkerized or given some other similar rust proof treatment in order to prevent further oxidation.

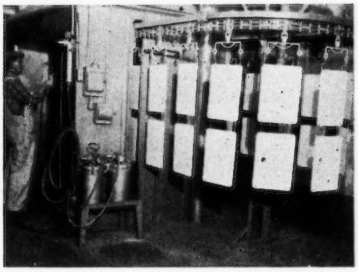


Figure 2—The repainting process.

The sign is now ready for painting. Three coats are applied, a prime coat followed by a second and third coat of high grade baking enamel. This paint is applied by the spray method after which the signs are baked in an infra-red oven resulting in a very hard glossy finish. Figure 2 illustrates the spraying process. From the picture it may be seen that the signs enter the spray booth on an endless conveyor. They are suspended on swivel hooks so that when one side has been completed the hook is rotated and the other side sprayed. After leaving the spray booth, the signs enter the infra-red oven. This oven is completely enclosed with the exception of two narrow openings, one at each end, just large enough to admit the work. The oven is comprised of 160 infra-red lamps mounted in two banks, 80 on a side. It is 14 feet long. With a track speed of 1½ feet per minute, approximately nine minutes are required for the trip through the oven which gives an ideal baking.

After the sign has received its three coats of paint it is then ready for stenciling. The well known silk screen method is used and the sign is then once more placed on the conveyor and sent through the oven for the final baking. Figure 3 shows the stenciled sign being mounted on the conveyor. In all, four bakings are required for each sign and with the equipment illustrated a capacity of 200 complete signs per day is possible.

Double Faced Signs

The rejuvenated sign is now ready for the street. However, before it can be installed, certain accessories are necessary. These consist of hangers and, where utility poles are not available, posts or stanchions. In the interest of efficiency, the City of Detroit uses a double faced parking sign. However, in the use of such a sign it is necessary that it be suspended out from the support in such a manner

Figure 3—Silk screen stenciling.

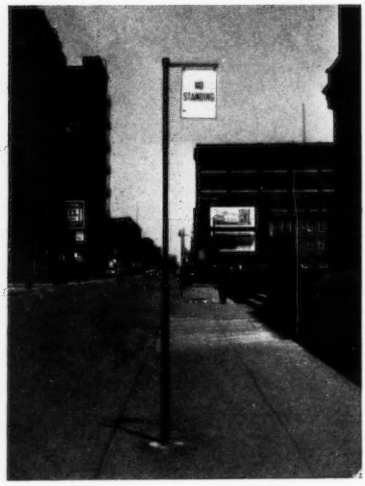


Figure 4—The remounted sign.

that both sides will be visible. Figure 4 illustrates a typical hanger for this use. This hanger is manufactured from band iron ¼ inch thick by 1¼ inches wide and is bent and shaped on suitable jigs for the purpose intended.

Due to the fact that a suspended sign of this type presents a considerable area to the elements, it has been found desirable to use attachments permitting the sign to swing freely, thus reducing wind pressure. Chain links have, therefore, been used in attaching the sign to the hanger. These links are made of ¼″ hot rolled steel which have been tinned for preservative purposes. The links are opened sufficiently to admit the sign and hanger after which they are again closed and the assembly is ready to mount on its support.

Details of Stanchion

Unless utility poles are available in the proper location it is necessary to mount the sign on a stanchion. Detroit uses a pipe stanchion. This is comprised of a seven-foot section of two-inch pipe and a six-foot section of 1¼-inch pipe coupled together with a reducer. The large end of the assembly is sunk into the ground or sidewalk 2½ feet, leaving 10½ feet exposed above the ground. This results in the bottom of the 18-inch parking sign being 9 feet high which complies with the Michigan standards for such installations.

These two different pipe sections for the stanchions are used to provide sufficient strength at the base to prevent any bending due to attempted vandalism by children and to provide better appearance. If the 2-inch pipe were used for the entire stanchion it would look rather heavy for the support of such a small sign. The installation shown in Figure 4 has been adopted and is of sufficient strength as well as presenting a neat and authoritative appearance.

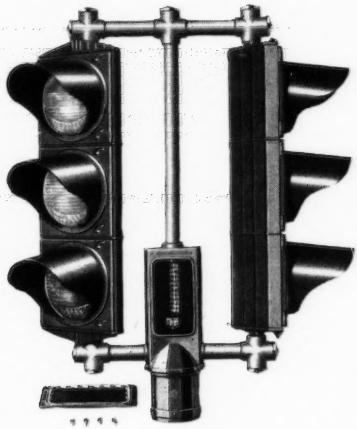
A Full Time Job

Detroit has 50,000 traffic signs in use and is operating under a maintenance schedule which requires that each of these signs be replaced every three years. With the addition of new installations, which are continuously being made, upwards of 1500 signs are manufactured and installed every month. Because of the processes described and the use of reclaimed steel this program has maintained a steady pace even in the face of war time conditions.

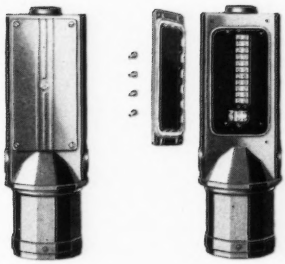
With the exception of cleaning and cutting, the same processes herein described may be used in the manufacture of signs from new steel. Detroit will discontinue reclaiming these steel signs after the war and will go to the use of new materials exclusively. This is believed sound economy. Under the above method it costs approximately $1.17 to manufacture a 12″ x 18″ parking sign. Of this total, the steel costs only 19 cents and in view of the labor required to clean and prepare reclaimed steel, it is found to be more economical to use new steel when it is available.

TRAFFIC SIGNALS by CROUSE-HINDS

Signals with Separate Terminal Compartments



Type TRPC-223D Signal



KL5748 Slipfitter with Terminal Block

To facilitate the field wiring of traffic signals, Crouse-Hinds has developed a new slipfitter which incorporates a terminal compartment.

The compartment is large and roomy with sufficient space to permit looping the underground cable into and out of it. The cable passageway between the pole and the terminal compartment is clear and unobstructed. The compartment is 9¼″ high by 5⅞″ wide by 3¼″ deep inside with a door opening of 8⅛″x4¼″.

The slipfitter is furnished with a twelve terminal connection block having eleven terminal plates with two binding screws each for hot wires, and a common terminal plate having six binding screws. Or, if preferred, the slipfitter can be supplied with two 3 pole N.E.C. cartridge fuse cutouts. In either case, the signals are supplied with the leads from the lamp receptacles cabled together and brought out to the connection block or cutouts.

CROUSE-HINDS COMPANY

SYRACUSE 1, NEW YORK, U.S.A.

GO — CAUTION — STOP

YALE ANNOUNCES TRAFFIC ENGINEERING FELLOWSHIPS

Ten Graduate Fellowships in Traffic Engineering are announced by the Bureau of Highway Traffic of Yale University. These Fellowships amount to $1400.00 each and provide for a full academic year of graduate study beginning October 1, 1945.

The regular course of Graduate Training in Traffic Engineering is being resumed at Yale this Fall for the first time since Pearl Harbor. Mr. T. M. Matson, Director of the Yale Bureau of Highway Traffic, in announcing the availability of Fellowships, stated that, "The resumption of Graduate Training in Traffic Engineering is especially timely in view of the acute street and highway transportation problems which now exist and which will grow worse as travel restrictions are lifted. Matters of traffic operations are being given increased attention by state and municipal officials in the planning of roadway facilities for the post-war period. The courses of instruction offered at Yale are designed to give the student skill and ability in analyzing traffic conditions and in planning for their improvement in both rural and urban areas."

Enrollment Limited

Enrollment will be limited to 35 students meeting the graduate requirements of the Bureau. "In addition to recipients of Fellowships, the course is open to returning veterans under the provision of the G.I. Bill of Rights," said Mr. Matson. "It is also expected that there will be students from city engineering and state highway departments who will enroll either on their own, or with some financial support made possible through special assignment by their employers."

The ten Fellowships have been made possible through a grant to the Bureau of Highway Traffic from the Automotive Safety Foundation.

Additional information concerning the course and Fellowships may be obtained by writing to the Bureau of Highway Traffic, Yale University, New Haven, Connecticut.

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VIRGINIA HIGH SCHOOL BOYS HELP SAVE ROADS

High school students helped save Virginia's highways when loss of manpower due to the war threatened to halt operations, R. P. Ellison of the Virginia Highway Department told a technical committee of the American Road Builders' Association in session in Washington recently. Since 1942, an average of 110 boys and girls between 15 and 18 years of age have been employed each summer in surveying parties, road design, bridge design, planning survey division, landscape division, equipment division and laboratories, he said. Many of these youngsters are entering their fourth year of service with the department and have become remarkably efficient technicians and draftsmen.

"With the loss of our experienced staff to the armed services, we were faced with the problem of maintaining 47,000 miles of highways, planning and construction of necessary access roads and preparing for the post-war period," stated the Virginia spokesman. "Denied trained and experienced personnel, we appealed to the high schools. Classes in draftsmanship under engineers were established, and students taking the courses were promised employment in the state department. In addition to these office duties and surveying parties, an average of 320 students worked as laborers on the highways during the summer in 1942, 1943 and 1944. We can truly say that the boys and girls of Virginia helped save our roads and streets."

In spite of the highway department's limitations, $21,000,000 worth of access roads were surveyed and planned during the war period, and plans sufficient for the first post-war year were completed, Mr. Ellison said. Virginia is among the few states to accomplish this latter task.

Plan Tomorrow's Highway Today

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TUTHILL HIGHWAY GUARD RAILS

TUTHILL Guard Rails possess these unusual features:

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SPECIAL NOTE!
TUTHILL Guard Rails are now available!

DON'T delay until the last minute the important decision regarding a PROPER Guard Rail to make safe, beautify and economize on your highway safety program, for post-war—and now! TUTHILL stands ready with a BETTER Guard Rail to fill your post-war and present needs in highway construction.

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431 CITIES OPERATING 200,000 PARKING METERS

As of Jan. 1, 431 cities were operating a total of 200,000 parking meters, with total receipts exceeding $10,000,000 in 1944, the American Municipal Association reports. Number of meters in operation ranged from 17 in Culpepper, Va., to 3,660 in Cleveland. Fourteen cities received more than $100,000 from parking meters in 1944: Cleveland $251,000; San Diego, $233,000; Portland, Ore., $224,000; Denver, $215,000; Houston, $193,000; Seattle, $167,000; Dallas, $164,000; Fort Worth, $144,000; Memphis, $133,000; Salt Lake City, $130,000; Columbus, $126,000; Spokane, $112,000; Toledo, $104,000; and San Antonio, $102,000. Indianapolis and Providence are considering installing meters. Indianapolis has adopted an ordinance providing for purchase of 2,000, but the ordinance is not yet effective. In Providence, the mayor has proposed the restoration of parking meters.—*News Bulletin, Public Administration Clearing House.*

INSTITUTE ACTIVITIES 10 YEARS AGO

Taken from Traffic Engineering, July 1935

E. W. James (Mem.), Chief of the Division of Highway Transport, U. S. Bureau of Public Roads, recently returned from a trip to Mexico and the republics of Central America in connection with the construction of the Inter-American Highway.

Observance of traffic control devices and regulations was discussed at the 65th annual convention of the A.S.C.E. held at Los Angeles, July 3-7, in papers by W. G. Eliot, 3rd (Assoc.), Highway Economist, U. S. Bureau of Public Roads, and E. B. Lefferts (Mem.), manager, Public Safety Department., Auto Club of Southern California.

According to a United Press report from Chicago, a man arrested for leaving his horse in a no-parking area contended that the steed was not a vehicle. The judge said: "The horse is fast disappearing, and we must pay it due respect. As long as I am a judge I will never rule against the horse. He may park where he wants to." This may be horse sense but our sympathy is for the traffic cop.

ITE NEWS AND PERSONALS

The Traffic Engineering Handbook Revision Committee has been reorganized and preliminary work is already under way. The following members are serving on the committee: W. Graham Cole—Chairman; William G. Eliot 3rd, Robert Holmes, T. M. Matson, R. L. Morrison, William B. Powell, J. W. Arch Bollong, T. J. Seburn, Guy Kelcey, Robert A. Mitchell, Harry Neal, Maurice O. Eldridge.

Washington Section Annual Meeting

The Washington Section held its First Annual Meeting on the evening of June 20, with an attendance of 33 members and guests. Officers elected for the coming year were C. G. Stoneburner, President; W. G. Eliot, Vice President; and M. C. Stark, Secretary-Treasurer.

Reports were made by retiring President Prisk and Secretary-Treasurer Eliot showing an active and successful year. Eight meetings have been held, with an average attendance of 25 members and guests. The Washington Section now has a membership of 36.

Three important committees submitted reports, (1) Committee on the 5-Year Post-War Traffic Plan for Washington, Earl Allgaier, Chairman; (2) Technical Activities Committee of the Washington Section, J. H. Mitton, Chairman; and (3) Committee on the Transportation Plan for the Metropolitan Area of Washington, C. G. Stoneburner, Chairman. Each report was freely discussed and criticized. It was voted that the first report, as amended at the meeting, be sent to the Commissioners of the District of Columbia. The second report, making numerous recommendations for new Section activities including the establishment of a permanent Technical Activities Committee under the chairmanship of the Vice President, was accepted. Final consideration of the last report, still incomplete, was deferred until it can be circulated to the membership and acted upon at a special meeting.

Members present at the meeting were Earl Allgaier, L. A. Andriacchi, E. A. Barton, W. F. Boardman, W. L. Braun, W. W. Davis, W. G. Eliot, H. F. Hammond, E. H. Holmes, R. S. Holmes, F. M. Kunz, D. W. Loutzenheiser, B. W. Marsh, D. G. Mickle, J. H. Mitton, O. K. Normann, C. W. Prisk, W. L. Robinson, M. C. Stark, C. G. Stoneburner, P. J. Stupka, and L. S. Tuttle. Guests were W. T. Adams, D. K. Chacey, H. W. Giffin, F. J. Grumm, W. B. Hampton, Guy Kelcey, O. L. Kipp, B. F. Locraft, R. T. Messer, J. G. Trapnell, and C. F. Van Blankensteyn.

The Section has accepted the invitation of Mr. M. O. Eldridge for an outing on Saturday afternoon, July 21, at his summer home in Arlington County, Virginia.

New Washington State Highway Director

The new Washington State Highway Director is Clarence Hickey, who has been Snohomish County Engineer at Everett for the last sixteen

years. During the preceding ten years he was Chief Deputy in the State Engineer's office. Previously he was assistant to the Engineer at Bremerton, Washington, for six months during the first world war. He was an Engineer in Victory, British Columbia, and Supervisor of Construction on the original Sultan River pipe line supplying Everett with water.

Pasadena Appoints Traffic Engineer

Mr. Peter K. Rask, one of the assistant engineers in the Engineering-Street Department of the City of Pasadena, California, has been appointed by City Manager C. W. Koiner as Traffic Engineer, serving under Mr. John H. Allin, City Engineer and Superintendent of Streets.

PERSONALS

Henry K. Evans (Assoc.), on leave as Traffic Engineer, National Conservation Bureau, reports that he is now stationed at Camp Blanding, Florida, undergoing 17 weeks of basic training in the infantry. Evans, editor-on-leave of TRAFFIC ENGINEERING, was inducted May 1. In a recent letter, he said, "Florida is the hottest place I've ever seen. Learning to be a rifle soldier is a new, though not especially desirable, experience for me. Everyone here tells me there is no chance of transferring to the Transportation Corps or any other branch, so it looks like I'm going to be out of traffic engineering for a while. My address is A-192-60, Camp Blanding, Florida, in case someone has time to drop a poor perspiring dog-face a letter."

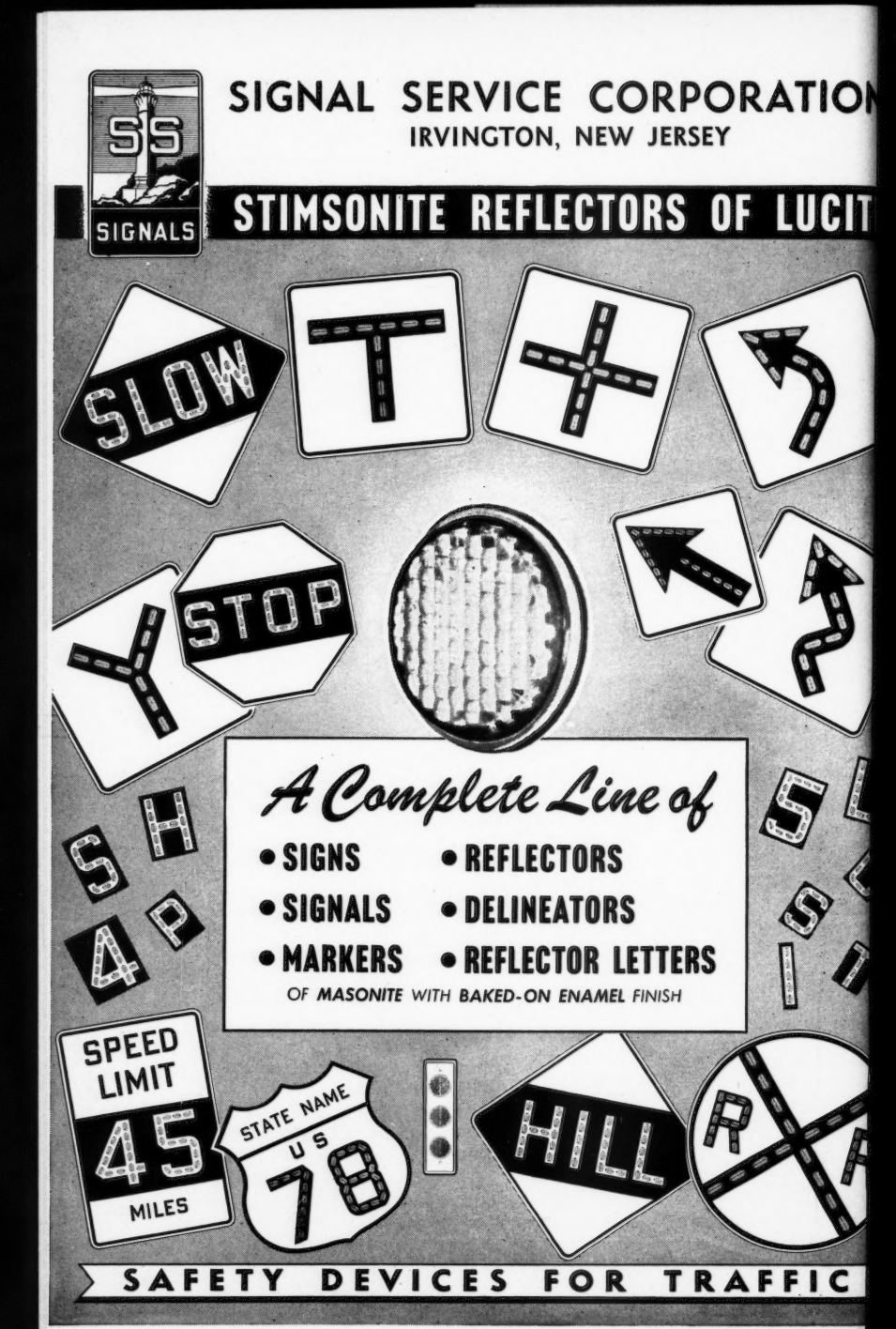
Brig. Gen. Alexander A. Hayton, (Affil.), of the Army of South Africa, according to a letter received from Mrs. Isabel Hayton, his wife, was released from a German prison camp by our forces about March 26th. He was captured with practically the entire Headquarters Staff of the Second South African Division at Tobruk and since release has been returned to a South African camp at Brighton.

The group of 98 officers and men were flown to England after their release from the German camp at Hadamar. They lost an average of 31 pounds during imprisonment, but said they were all extremely fit and in the best of spirits. Brigadier Hayton said one of the hardships in Germany was the inability to buy food outside to supplement their meagre rations. In Italy they had been able to do so, although they had to pay as much as £20 for a ham. He said the Brighton people kept giving them presents from the moment they arrived until they retired the first night.

Lloyd M. Braff (Mem.) has been engaged as Traffic and Transportation Engineer by De Leuw, Cather & Co., consulting engineers of Chicago. Braff, formerly director, traffic design division, Traffic Engineering Bureau, City of Detroit, prior to that was assistant triffic engineer of Chicago Surface Lines.

Braff has recently completed the organization and direction of a parking survey in Atlanta, Ga., as special consultant to H. W. Lochner & Co. and De Leuw, Cather & Co., in connection with a comprehensive study and report on expressways, major streets, transit routings, truck and rail terminals and other phases of a complete transportation plan.

His first assignment for De Leuw, Cather & Co. was in Cleveland where 3,000 Boy Scouts conducted an origin and destination study of Cleveland Transit System passengers on June 5th. Modernization of the system, including provision of rapid transit facilities, will be planned on the basis of this and other information to be computed under Mr. Braff's direction.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